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BAA 03-33 PROPOSER INFORMATION PAMPHLET

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The Defense Advanced Research Projects Agency (DARPA) often selects its research efforts through the Broad Agency Announcement (BAA) process. The BAA will be posted directly to FedBizOpps.gov, the single government point-of-entry (GPE) for Federal government procurement opportunities over $25,000. The following information is for those wishing to respond to the Broad Agency Announcement.

Multicell and Dismount Command and Control, SOL BAA 03-33, DUE: 08/14/03; POC: Mr. Gary Sauer, DARPA/IXO; FAX: (571) 218-4550

I. Background: This BAA is structured to specifically support the mission of the execution of the ***Defense Advanced Research Project Agency (DARPA)*** Future Combat System Command and Control (FCS C2) Program.

Program Description:
The FCS C2 program is a Defense Advanced Research Projects Agency (DARPA) led effort, with the cooperation of the U.S. Army Communications–Electronics Command (CECOM) Research and Development Center (RDEC).

The focus of this effort is to expand upon the research effort of the Future Combat Systems Command and Control (FCS C2) Program to determine the next level of requirements, C2 functions and information profiles/flows for FCS Unit Higher Headquarters, Multiple FCS Unit's Command and Control, Dismounted Soldier and Dismounted Commander Operations. The research to date has built a prototype C2 system which integrates previoulsy stove-piped Battle Command operating systems/functions into a single tailorable display for decision-making. The supporting Command and Control Experimental Demonstration System developed in the FCS C2 Program will be extended to support this expanded research in determining the technical challenges in Battle Command for Multiple FCS Unit interactions, Higher Headquarters' Command and Control, and Dismounted soldiers as a subsystem to the FCS Family of Systems design. The current command and control system experimental demonstrator (prototype) for the FCS Unit already illustrates the potential for a significantly reduced staff to control and employ its organic assets within the unit. In addition to minimizing supporting staff, an important part in expanding this research effort will be to assess whether the system under test is scaleable to other FCS echelons and joint task force elements to facilitate future C2 with multiple Battle Command functions integrated into a single Battle Command System to empower the decision-maker with information to understand current and future states while reducing uncertainty.

The FCS C2 program had several distinct components: The Integrated C2 Systems and Operational Architecture, the development of a simulation federation to stimulate the C2 prototype, a supporting Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR) lab and the development of the C2 prototype. The program began with a

Start-up initiative (Phase I), followed by an FCS C2 Architecture Study initiative (Phase II) and the FCS C2 development and Experimentation initiatives (Phase III). Phase IV of the FCS C2 program is the subject of this request and includes continued FCS C2 development/maturation and Experimentation in support of Multicell and Dismounted C2 capabilities.

FCS C2 Start-up phase (Phase I)
The start-up phase—October 2000 - January 2001— consisted of the preparation of program plans, personnel recruitment, and contracts.

FCS C2 Study (Phase II)
The FCS C2 Study was a two-phased effort, the first of which was a 10-month effort to initially investigate and document the following:

- An operational and systems architecture for the C2 Prototype, developed in accordance with version 3.1 of the Joint Technical Architecture (JTA) "Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) Framework 2.0" (December 1997). This framework is a standard adopted by the Department of Defense (DOD) and the North Atlantic Treaty Organization (NATO) community for developing systems architectures.

The FCS C2 Study or Technical Team published their initial report, *Future Combat System (FCS) Unit Cell C2 Architecture Study, Interim Report* in January 2002. This report was leveraged to execute the experimentation effort in phase 3. The second phase, which concluded in April of FY03, involved refining and updating the results of the first phase.

FCS C2 Program Organization
To build the C2 Prototype, DARPA and the CECOM RDEC formed three teams: a Technical Team, an Operational Team, and an Experimentation Team. The Technical Team consisted of personnel from academia, the Army, and industry. This team was primarily focused on the FCS C2 Study effort described above, to include making subsequent refinements and updates to maintain its accuracy and applicability to program goals. The Operational Team was mentored by senior level active duty and/or retired military personnel and consisted of several School of Advanced Military Studies (SAMS) graduates with positional experience throughout the U.S. Army's Forces Command (FORSCOM) and the Training and Doctrine Command (TRADOC). This team was primarily focused on developing the Unit Cell's operational information flows, its experimental force structure, and the Doctrine, Tactics, Techniques, and Procedures (DTTP) used in each experiment. The Experimentation Team included a team of human performance scientists from the Army Research Institute (ARI) and was primarily focused on developing the C2 Prototype, the FCS C2 Simulation Federation, and the overall plan to test the project's hypothesis. This program organization, to include the general roles/responsibilities discussed above, will be maintained throughout the duration of the support Multicell/Dismounted C2 effort.

The C2 Prototype (Phase III)

Vision: Provide information to the operator such that the user is informed but not overburdened. CSE consisted of:–Operator Workstations, Collaboration Server (CS), Collective Intelligence Module (CIM), and Platform Support Environment (PSE).

- Planning and execution are integrated through the workstations and the collaboration server. This allows all workstations to simultaneously see and manipulate plans and execution information. The design includes provisions for a CDR decision aid using a knowledge base.
- The CIM and the PSE endow the Unit with it's network centric behavior.
  - The CIM is aware of the CDR's intent. The execution of the current tactical situation will be enabled through the use of an expert knowledge based system.
  - The PSE defines platform TTP's using an expert knowledge based system (e.g., evasive maneuver).

FCS C2 Experimentation (Phase III)

The experimentation effort consisted of developing and testing the prototype C2 software in a series of experiments to validate the C2 system design Key to this effort is a crawl, walk, run approach, while reviewing the enabling technologies and systems (i.e. C2 Prototype, One Semi-Automated Forces TestBed (OTB), Sensor Effects model). Through its first four experiments, the FCS-C2 program has developed an initial infrastructure to represent critical integrated functionalities of the FCS unit maneuver, lethal and suppressive effects and intel/sensors. Future experiments anticipate addition of detailed dismounted simulation, network-centric communication effects, RF jamming and other non-lethal effects, logistics/sustainment and expansion of the force structure beyond that of the FCS unit. Existing simulation infrastructure, including a heavily-modified version of OTB, a Sensor Effects Model (SEM) and other supporting components are expected to require enhancements and supplements to provide the necessary synthetic environment for continued evaluation of the prototype software and affiliated battle concepts.

II. SCOPE - RESEARCH TOPIC INTEREST:

This part of the BAA contains statements of the Research Interests required by DARPA/ IXO. Prior to proposal submission, questions on technical matters and availability of project funding relating to a particular Research Interest should be directed to the DARPA Program Manager via email to BAA03-33@darpa.mil. When responding/inquiring on a specific area of research, refer to the Topic Number listed below.

Multicell and Dismounted C2 Background

The Multicell and Dismounted C2 research program (effort covered by the requirements of this BAA) will build on the earlier success and approach of the FCS C2 experimentation effort and expand the decision space to the operation of multiple FCS equipped units with higher headquarters, dismounted soldiers and joint force connectivity. The program's objective is to determine how further integration of Battle Command functions of multiple FCS units, dismounts and higher headquarters (joint) may be achieved to support a network centric force. The program will build an expanded decision space to support these eschelons and functions with full collaboration. The program will consist of four major elements: 1) Architecture development and documentation 2) testbed development and expansion, 3) Expansion of the decision space and Human Computer

Interface to address the aforementioned levels of command and 4) Conduct a series of experiments as illustrated in the milestone chart to measure and assess the effectiveness of the mission software modules supporting the expanded decision space.

Schedule and Milestones

MILESTONE	TIME FRAME	EVENT
1	2QFY04	-C2 Prototype/C4ISR and SIM/Lab Development to support Dismounted functionality coded and tested -Experimentation and Analysis plan to support Exp. #5
2	3QFY04	-Dismounted Pilot Test #5 successfully executed
3	1QFY05	-C2 Prototype/C4ISR and SIM/Lab Development to support MultiCell and Higher C2 functionality coded and tested -Experimentation and Analysis plan to support Exp. #6 completed
4	2QFY05	MultiCell and Higher Pilot Test #6 successfully executed
5	2QFY05	-C2 Prototype/C4ISR and SIM/Lab improvements to support combined C2 functionality is coded and tested -Experimentation and Analysis plan to support Exp. #7 completed
6	3QFY05	-Combined Pilot Test #7 successfully executed
7	4QFY05	-C2 Prototype/C4ISR and SIM/Lab improvements to support Joint functionality coded and tested -Experimentation and Analysis plan to support Exp. #8 completed
8	1QFY06	-Joint Pilot Test #8 successfully executed

The FCS-C2 Program is a fully interrelated program consisting of several interrelated Technical Topic Areas. All offerors selected to provide Contractor Technical or other support under this BAA, as directed by the government, will be required to work as part of a ***"Combined Technical Team"***. As such, offerors should be prepared to work in close coordination with the collective personnel supporting the other Topic Areas of this BAA.

The current Research Topic Interest Areas

1. Battle Command and Control For Future Combat Systems (C2 Prototype)

2. C4ISR Modeling & Simulation For C2 Concept Assessment

3. FCS C2 Architecture Development

4. FCS C2 Experiment Planning, Execution, and Analysis

5. Infrastructure Support for Development, Simulation, and Experimentation Environments

Topic Number: 1
Research Interest: Battle Command and Control for Future Combat Systems (C2 Prototype).

Description: This topic seeks to encourage the developmental work in the area of mission software development that integrates formally stove-piped Battle Command functions into a single integrated display for decision making of an FCS equipped force. This program will be examining multiple unit, higher headquarters and dismounted information needs for decision making thru integrated and innovative Battle Command solutions.

Background: The FCS C^2 approach to Battle Command & Control was implemented in the form of synthesized/analyzed information enabling the tactical commander to leverage opportunities by focusing on fewer unknowns, clearly visualizing current and future end states, and dictating the tempo within a variety of environments, while being supported by a significantly reduced staff by employing information technologies such as intelligent agents, real time collaboration, and expert knowledge based solutions resulting in a command and control capability that is commander and execution-centric versus staff and planning centric. This prototype system cooperatively integrates the current battlefield functional areas that include maneuver, fire support, air defense, intelligence, and combat service support into a single cohesive application that embraces network centric principles. This cooperative integration allows the commander to achieve unprecedented battle space situational understanding enabling the commander to stay inside of his adversaries Observe, Orient, Decide, and Act (OODA) loop permitting the commander to engage on his own terms. This intial development facilitated the C^2 system in assisting the commander and staff based on available information to conduct both execution and dynamic re-planning of the planned operation.

Objectives: The first objective is to use the architectural framework products developed in the architecture study and previous program products to integrate and code the additional Battle Command functions identified in the aforementioned to exercise the command and control of multiple FCS units, their respective higher headquarters and dismounted FCS soldiers within the FCS system of systems design. These mission software modules will need to support the variety of staff functions within the Military Deliberate Decision Making process to facilitate planning, execution and future decision making activities. This will support the expansion of the decision space as developed in the FCS C2 program to other FCS levels of command and connectivity into the Joint Force.

As currently envisioned, the FCS C2 solution will ultimately be capable of identifying schemes of maneuver, decisive points, favorable opportunities, enemy weaknesses, account for terrain and weather, and conceptualize course of actions through collaborative planning, rehearsal, and rapid course of action analysis or war gaming. In making these decisions the FCS C2 solution would

synchronize maneuver, fires, and RSTA activities while maintaining situational understanding and, thereby, direct decisive action. Additionally, it is expected that the FCS C2 solution will take into consideration operational efficiencies that can be gained through an effective Human Computer Interface (HCI). Such HCI functionality might include concepts such as displaying reports so that correlation of information can rapidly lead to understanding and subsequently translate into an unambiguous command; providing an unobtrusive mechanism to monitor the actions of subordinate elements; provide for easy assessment of the results of ordered actions; and, simply stated, serve as a effective/efficient tool to integrate the many battlefield functions into a manageable few to improve performance levels and minimize physical, cognitive, and sensory demands enabling maximum focus on the highest priority tasks for extended periods of time. Lastly, as currently envisioned, an essential capability of the FCS C2 solution is that of a scalable C^2 architecture deemed necessary for multi echelon operations from individual soldier to Unit of Action or Unit of Employment. Ultimately, the goal is to develop an integrated set of component capabilities to support decision making by the Commander engaged in combat operations in an extremely agile, rapidly deployable situations, ranging from Major Theater War to Stability and Support Operations.

The second objective is to provide research services in information management for the development of mission level software modules and supporting hardware. This will entail the production of designs for commander and staff decision aides and interfaces as part of the evolving innovative C2 prototype to support FCS command and control activities. The expansion of the FCS Knowledge Base and associated integrated Battle Command rules will also be addressed in this topic.

The broad scope of the above description will require offers to present unique solutions which are measurable through an instrumented environment during human in the loop experiments. Offers will be expected to jointly work with performers in other program functional areas as described in this document to effectively measure the impact and performance of the Battle Command software products ability to improve situational awareness for a commander and small supporting staff. Integrated Battle Command software modules will be developed for multiple FCS units, higher headquarters and the dismounted soldier. Offers will need to support an aggressive development, test, and incremental build schedule in support of 4 experiments which will be separated by 5 month intervals.

Information about current prototype system performance and research output may be made available upon request to the Program Manager.

Topic Number: 2
Research Interest: C4ISR Modeling & Simulation for C2 Concept

Description: This topic seeks to encourage developmental work in the area of C4ISR modeling and simulation support to integrated Command and Control protoype for the FCS unit's family of systems design. A realistic C4ISR simulation provides a synthetic environment in which concepts and prototype software can be evaluated through appropriate stimulation and response. Simulation provides a means to realistically represent current "real-world" capabilities in all areas of the C4ISR spectrum, as well as those that do not yet exist.

Background: As the FCS-C2 program continues to enhance its prototype Command & Control (C2) software and expand its exploration of Battle Command concepts for the Future Combat System (FCS), the synthetic C4ISR simulation environment must adapt to provide the necessary stimulus and response to this prototype C2 system. Through its first four experiments, the FCS-C2 program has developed an initial infrastructure to represent critical integrated functionalities of the FCS unit: maneuver, lethal and suppressive effects, and intel/sensors. Future experiments anticipate addition of detailed dismounted simulation, network-centric communication effects, RF jamming and other non-lethal effects, logistics/sustainment and expansion of the force structure beyond that of the unit cell. Existing simulation infrastructure, including a heavily-modified version of One Semi-Automated Forces TestBed (OTB), a Sensor Effects Model (SEM) and other supporting components provided the stimulus to the prototype under test and are expected to require enhancements and supplements to provide the necessary synthetic environment for continued evaluation of the prototype software and affiliated battle concepts.

Objectives: Offers will need to support the objective of establishing a realistic federation that emulates the conditions and performance of the FCS systems of systems force within a stable simulation federation for instrumented data collection. Realism of systems performance and simulated environments will be paramount to establishing the required stimulus to the C2 prototype. Submissions should address the individual soldier and platform entity level which includes system and payload performance.

Key aspects/principles associated with the development of the C4ISR synthetic infrastructure are paramount to answering this topic. Innovative and novel approaches which stress realism in modeled performance of ISR systems is highly encouraged. Since development time between the key experiments is limited, offerors will be expected to provide solutions which keep with the program's approach to software design and simulation efforts under this topical area that follow the "Adopt, adapt, develop" concept. Heavy adaptation of the existing infrastructure is expected; however, other Government and industry models will be adopted where appropriate or developed from concept as necessary. The focus of all resultant software products will be on justifiable technical realism and real-time physics-based interaction. To support anticipated program experiments, it will be necessary to develop and modify constructive and virtual simulation software to meet special conditions of C4ISR capabilities envisioned for the Army of the future.

Topic Number: 3
Research Interest: FCS C2 Architecture Development

Description: Under the scope of this topic area, the offerors required performance will be broad, encompassing a wide range of research activities, to include the coordination, conduct and documentation of an architecture study to develop an operational and systems FCS C2 Architecture at the dismounted soldier level of command through the higher headquarters and joint levels of command supporting the Objective Force.

Background: DARPA has established the FCS C2 Follow-On program in cooperation with the Army. This topic area effort is the follow-on to the FCS C2 Architecture Study and Experimentation funded by DARPA The architecture development will consist of a study effort comprised of military, government, university, and industry personnel to develop an operational and system architecture for the Objective Force Warrior multiple FCS units, Higher Headquarters and joint levels of command to support the Objective Force. Research efforts will include the development of the initial functional battle command requirements for the respective supporting C2 system. This C2 system is intended to exploit emerging technological advances and enable dramatically new and enhanced C2 capabilities. The system would provide more accurate, timely, and relevant information to the commander so that he can exploit his intuition, be distracted by fewer unknowns, leverage tactical opportunities, and dictate the operational tempo, all while being supported by a significantly reduced staff. This topic area will also require documentation and updating of the architecture based on the results of a series of planned experiments to test the prototype C2 software and assess the C2 system design.

Objectives: The first objective would be to conduct and organize an architecuture study to evaluate the research problem of determining the critical information needs of dismounted soldiers, multiple FCS units, higher and joint supporting headquarters in a network centric environment involving manned and un-manned systems.

The second objective would be to produce the series of required architectural framework products to support the development of an operational and systems architecture that could be used as the basis from which initial C2 prototype Battle Command functions, supporting C4ISR modeling and testbed simulations may be further developed and integrated to support the expanded decision space of the aforementioned levels of command and control interfaces.

Topic Number: 4
Research Interest: FCS C2 Experiment Planning, Execution, and Analysis

Description: This topic area seeks the developmental work in the area of Experiment Planning, Design , Execution, Data Collection and Analysis. Innovative approaches to support experimentation in Battle Command in an emulated network centric environment are highly encouraged.

Background: DARPA has established a FCS C2 follow-on program in cooperation with the Army. The program will consist of architecture development to develop an operational and system architecture for the Objective Force Warrior, multiple FCS units, Higher Headquarters and joint levels of command to support the Objective Force. Research efforts will include the development of the initial functional battle command requirements for the respective supporting C2 system. Research conducted under another topic will develop the required C2 functionality for the prototype under test. This C2 system is intended to exploit emerging technological advances and enable dramatically new and enhanced C2 capabilities. The system would provide more accurate, timely, and relevant information to the commander so that he can exploit his intuition, be distracted by fewer unknowns, leverage tactical opportunities, and dictate the operational tempo, all while being supported by a significantly reduced staff. This topic area will require the development and execution of the

supporting designs, plans and methods of data collection and analysis to support the planned series of experiments to test the prototype C2 software and assess the C2 system design.

Objectives: The first objective is to develop experimental plans and designs for the execution of 4 distinct experiments and supporting pilot tests that would support the assessment and measurement of an operational and systems architecture, and prototype C2 software, that would support dismounted soldiers, multiple FCS unit commands, higher headquarters and joint task force integration within the Objective Force.

The second objective is to develop a supporting methodology for the measurement of the performance of the C2 prototype and supporting architecture under test. Since the research area is the merger of the Art and Science of warfare measures for human factors must also be developed.

The third objective is to develop a supporting data collection, analysis, and reduction plan (quantitative and qualitative) based on the aforementioned objectives to support the assessment of the system and architecture under test in a series of 4 distinct Battle Command experiments.

Topic Number: 5
Research Interest: Infrastructure Support for Development, Simulation, and Experimentation Environments

Description: This topic seeks to encourage developmental work in the area of hardware/software integration, production of modeling and simulation support systems, prototyping, and systems engineering support to enable peek performance and reliability of Developmental, Simulation, and Experimentation Environments.

Background: Through its Experimentation efforts, the FCS C2 program is developing concepts for developing and testing the principles of command and control in a network-centric warfare environment. This entails greater information for the commander, from all possible sources, in a fused and integrated fashion. To properly test and stimulate this type of C2 component, the FCS C2 Experimentation site had to develop a myriad of simulation environments in the areas of force-on-force operations, sensor controls, imagery, virtual reality, and communication. The Experimentation site is designed to emulate the future network centric environment and support data collection and measurement of the Battle Command technology's performance in simulation based free play engagements.

Objectives: The first objective is to implement support for fully collaborative Development, Simulation, and Experimentation environments. The systems that support these environments must be designed, produced, and integrated with networking, HW/SW integration, and experimentation execution and data capture issues in mind. Environments must be reliable, kept up to date with the latest hardware and software technology, and support specifications of the C2 system and the modeling and simulation environments. Demonstration of knowledge in communication, data collection, video capture, network support, hardware, design and configuration management technologies is strongly encouraged.

The second objective is to provide research services for the Experimentation facility. This may entail, but not limited to, producing designs for new simulation support systems, coordinating maintenance schedules, fabricating and/or reproducing existing systems in the FCS C2 Experimentation sight as well as remote locations, planning for the disassembly, shipment, and reassembly of systems when moved offsite for demonstrations, experiments, or various DOD and Army conferences, coordinate with POCs at such locations in regards to shipping, power supply, setup and display requirements, develop system equipment requirements, facilitate the procurement of said equipment, all while closely coordinating with government project managers and engineers.

The third objective of this effort is to produce/fabricate experimental testbed simulators for the FCS C2 Experiments to allow for the most realistic experimental experience as possible. These simulation systems must emulate existing operational capabilities and incorporate a full complement of hardware and software to support the designed simulation systems. The simulators may take the form of command and control vehicles, troop transport vehicles, standalone dismounted operations simulators, simulation training systems, and others yet to be determined. Producer of simulation testbed simulators must have access to a fabrication facility with the necessary equipment. Producer of said equipment is required to fully collaborate with the government designer and experimentation design performer and must have the ability to precisely interpret directions and designs. Prior furbishing of similar testbeds is encouraged.

The functional requirements of the Prototype FCS C2 system and Commander's Support Environment (CSE): Proposed research should investigate innovative approaches and techniques that lead to or enable revolutionary advances in the state-of-the-art. Proposals are not limited to the specific strategies listed above, and alternative visions will be considered. However, proposals should be for research that substantially contributes towards the goals stated. Research should result in prototype hardware and/or software demonstrating integrated concepts and approaches. Specifically excluded is research that primarily results in evolutionary improvement to the existing state of practice or focuses on a specific system or solution. Integrated solution sets embodying significant technological advances are strongly encouraged over narrowly defined research endeavors. Proposals may involve other research groups or industrial cooperation and cost sharing.

Offerors may submit one or more proposals against any of the five (5) topic areas identified above. It is the Government's intent that no more than one proposal be selected for any given topic area, and that Topic Area 1 and Topic Areas 2 through 5 be awarded to separate offerors. Offerors are permitted to propose on any number/combination of Topic Areas 2 through 5 (i.e., one topic or multiple topics through a teaming approach).

Period of Performance: The general contractual period of performance is anticipated to comprise approximately eighteen (18) months duration, however contracts may be executed for a lesser period of time. The specific duration will be dependent on the performance goals of the Topic Area, but will not exceed twenty-four (24) months without options or thirty-six (36) months with options.

SUBMISSION PROCESS

The Defense Advanced Research Projects Agency/Information Exploitation Office (DARPA/IXO) requires use of a BAA Tool. The tool is intended to facilitate an electronic process beginning with the abstract/proposal uploads through the review and evaluation of submitted documents. Instructions for use of the DARPA/IXO BAA Tool are available for download at http://www.darpa.mil/ixo/solicitations/multicell/index.htm. Failure to comply with these submission procedures may result in the submission not being evaluated.

All offerors MUST register at: http://www.tfims.darpa.mil/baa 2 weeks prior to submitting a proposal. PLEASE NOTE: The deadline for registration is **07/31/03** at the URL listed above. Only the lead or prime offeror should register. One registration per proposal should be submitted. This means that an offeror wishing to submit multiple proposals should complete a single registration for each proposal. By registering, the offeror has made no commitment to submit. Proposal submissions must be unclassified. The offeror must upload the electronic version of the full proposal to the DARPA website by 12:00 NOON (ET) **Thursday, August 14, 2003** in order to be considered during the initial evaluation phase. However, BAA 03-33, **Multicell and Dismount Command and Control**, will remain open until 12:00 NOON (ET) **Wednesday, June 30, 2004**. Thus, proposals may be submitted at any time from issuance of this BAA through **Wednesday, June 30, 2004**. While the proposals submitted after **Thursday, August 14, 2003,** deadline will be evaluated by the Government, offerors should keep in mind that the likelihood of funding such proposals is less than for those proposals submitted in connection with the initial evaluation and award schedule. Proposals not meeting the format described in this PIP may not be reviewed. This notice, in conjunction with the BAA 03-33 FBO and all references, constitutes the total BAA. No additional information is available, nor will a formal RFP or other solicitation regarding this announcement be issued. Requests for same will be disregarded.

The typical proposal should express a consolidated effort in support of one or more technical topic areas. Disjointed efforts should not be included in a single proposal.

Restrictive notices notwithstanding: Proposals may be handled, for administrative purposes only, by a support contractor. This support contractor is prohibited from competition in DARPA technical research and is bound by appropriate non-disclosure requirements.

EVALUATION AND FUNDING PROCESSES

Proposals will not be evaluated against each other, since they are not submitted in accordance with a common work statement. DARPA's intent is to review proposals as soon as possible after they arrive; however, proposals may be reviewed periodically for administrative reasons. For evaluation purposes, a proposal is the document described in PROPOSAL FORMAT Section I and Section II (see below). The submission of other supporting materials along with the proposal is strongly discouraged.

Funds may not presently be available for the research interests represented in this Broad Agency Announcement. No contract award will be made unless appropriated funds are available for research and development. Prospective offerors are reminded that only a duly warranted Contracting Officer may obligate the Government to an agreement involving expenditure of Government funds. Multiple awards are anticipated.

Evaluation of proposals will be accomplished through a technical/scientific/business decision process with technical and scientific considerations being most important. Evaluations will be performed using the following criteria listed in descending order of relative importance:

(1) **Quality and Technical Merit:**

- Understanding of scope of the problem(s) and identification of technical issues
- Soundness and completeness of the system design.
- Potential for highly reliable video understanding solutions
- Justification of design choices as compared to alternative techniques
- Degree of innovation; potential for revolutionary advance

(2) **Relevance of Proposed Approach to the Program Goals**

- Level of realism and the clear definition of the problem domain
- Suitability and clarity of the proposed capabilities for operational purposes
- Quality and clarity of the Statement of Work (SOW) and Program Plan.
- Quality of the Evaluation Plan

(3) **Capabilities and Experience**

- Qualifications of proposed technical personnel and their availability for the duration of the contract
- Offeror's experience related to the proposed technology area
- The ability to manage the proposed effort
- Adequacy of proposed hardware and software infrastructure
- Adequacy of security plan

(4) **Approach to Technology Transfer**

- Understanding of video system architectures in laboratory and operational environments
- Potential for low-cost integration into operational environments
- Commitment to delivering results to others

(5) **Cost Realism and Value of Proposed Work to Government**

- The total cost relative to benefit.
- The realism of cost levels for facilities and staff (including students)

- The cost-effective use of existing equipment and software; competitive costs on procurements
- The cost-effectiveness of technology transfer

Proposals may be reviewed by non-government personnel; however, contractors will not be used to conduct evaluations or analyses of any aspect of a proposal submitted under this BAA, unless one of the three conditions identified in FAR 37.203(d) applies.

The Government reserves the right to select for award all, some, or none of the proposals received. Proposals identified for funding may result in a contract, grant, cooperative agreement, or other transaction depending upon the nature of the work proposed, the required degree of interaction between parties, and other factors. If warranted, portions of resulting awards may be segregated into pre-priced options.

GENERAL INFORMATION

Proposals not meeting the format described below in this pamphlet may not be reviewed. Proposals **MUST NOT** be submitted by fax or e-mail; any so sent will be disregarded. This notice, in conjunction with the BAA 03-33 FBO Announcement and all references, constitutes the total BAA. At the DARPA Program Manager's discretion, a Frequently Asked Questions (FAQ) list will be provided. The URL for the FAQ will be specified on the DARPA/IXO BAA Solicitation page. No additional information is available, nor will a formal Request for Proposal (RFP) or other solicitation regarding this announcement be issued. Requests for same will be disregarded. All responsible sources capable of satisfying the Government's needs may submit a proposal that shall be considered by DARPA. Historically Black Colleges and Universities (HBCUs) and Minority Institutions (MIs) are encouraged to submit proposals and join others in submitting proposals. However, no portion of this BAA will be set aside for HBCU and MI participation due to the impracticality of reserving discrete or severable areas of this research for exclusive competition among these entities.

Government contractors are required to register at the Government's Central Contractor Registration site in order to negotiate contracts with most government agencies. This URL is provided as a reference: **http://www.ccr.gov**.

REPORTING REQUIREMENTS/PROCEDURES: The Award Document for each proposal selected and funded will contain a mandatory requirement for submission of DARPA/IXO Quarterly Status Reports and an Extended Requirement for July Reports. These reports, described below, will be electronically submitted by each awardee under this BAA via the DARPA/IXO Technical – Financial Information Management System (T-FIMS).

The Technical-Financial Information Management System (T-FIMS) Interactive reporting system facilitates technical and financial reporting on-line. Offerors shall incorporate the following T-FIMS reporting requirements into the deliverable and project schedule.

I. T-FIMS Financial Report (incurred and invoiced data)
II. Quarterly Reports: Due the 15th of months January, April, and October, and an extended quarterly report on the 15th of July (requirements below).
    a. Technical Report (include all sections that are applicable, for each quarterly report)
        i. Verify General Information
            1. Organization, PI, Project Title, Agent, Contract No.
        ii. Include Technical Approach
            1. Goals
            2. Accomplishments
            3. Significant advances/changes
        iii. Include Deliverables
        iv. Include Transition Plan
        v. Include Publications
        vi. Include Meetings and Presentations
        vii. Include Project Plans
        viii. Include Near-term Objectives
    b. Financial Report
    c. Project Status/Schedule
III. Extended Requirements for July Report
    a. All Sections of the Status Report
    b. QUAD Chart
        i. Visual Graphic
        ii. Impact
        iii. New Technical Idea (s)
        iv. Schedule
    c. Financial Data
        i. Date anticipated for 75% Obligation of funds
        ii. Date anticipated for 100% Obligation of funds
        iii. Amount required for next funding increment on this effort (contract)

PROPOSAL FORMAT

Technical and cost proposals must be submitted as separate volumes (Technical as Volume I, Cost as Volume II), and must be valid for 180 days.

All eligible sources may submit a proposal which shall be considered against the evaluation criteria set forth herein. Proposals with fewer than the maximum number of pages will not be penalized. Proposals exceeding the page limit will not be reviewed beyond the maximum page limit. Non-cost information incorporated into the unrestricted size Volume II cost proposal will not be considered. Offerors are encouraged to submit concise, but descriptive, proposals.

Offerors should apply the restrictive notice prescribed in the provision at FAR 52.215-12, Restriction on Disclosure and Use of Data, to trade secrets or privileged commercial and financial information contained in their proposals.

Volume I Technical Proposal

Technical proposals shall include the following sections, each starting on a new page (where a "page" is 8-1/2 by 11 inches with type not smaller than 12 point) and with text on one side only. Volume I shall not exceed 40 pages total. Maximum page lengths for each section are shown in braces {} below.

Section I. Administrative

The BAA Confirmation Sheet {1 page} will include the following:

A. BAA number;
B. Technical topic area;
C. Proposal title;
D. Technical point of contact including: name, telephone number, electronic mail address, fax (if available) and mailing address;
E. Administrative point of contact including: name, telephone number, electronic mail address, fax (if available) and mailing address;
F. Summary of the costs of the proposed research, including total base cost, estimates of base cost in each year of the effort, estimates of itemized options in each year of the effort, and cost sharing if relevant;

Section II. Detailed Proposal Information

This section provides the detailed discussion of the proposed work necessary to enable an in-depth review of the specific technical and managerial issues. Specific attention must be given to addressing both risk and payoff of the proposed work that make it desirable to DARPA.

A. {1 Page} Innovative claims for the proposed research.
This page is the centerpiece of the proposal and should succinctly describe the unique proposed contribution.

B. {1 Page} Proposal Roadmap
The roadmap provides a top-level view of the content and structure of the proposal. It contains a synopsis (or "sound bite") for each of the nine areas defined below. It is important to make the synopses as explicit and informative as possible. The roadmap must also cross-reference the proposal page number(s) where each area is elaborated. The nine roadmap areas are:

1. Main goals of the proposed research (stated in terms of new, operational capabilities for assuring that critical information is available to key users).

2. Tangible benefits to end users (i.e., benefits of the capabilities afforded if the proposed technology is successful).

3. Critical technical barriers (i.e., technical limitations that have, in the past, prevented achieving the proposed results).

4. Main elements of the proposed approach.

5. Rationale that builds confidence that the proposed approach will overcome the technical barriers. ("We have a good team and good technology" is not a useful statement.)

6. Nature of expected results (unique/innovative/critical capabilities to result from this effort, and form in which they will be defined).

7. The risk if the work is not done.

8. Criteria for scientifically evaluating progress and capabilities on an annual basis.

9. Cost of the proposed effort for each performance year.

C. {2 Pages} Research Objectives:

1. Problem Description. Provide concise description of problem area addressed by this research project.

2. Research Goals. Identify specific research goals of this project. Identify and quantify expected performance improvements from this research. Identify new capabilities enabled by this research. Identify and discuss salient features and capabilities of developmental hardware and software prototypes.

3. Expected Impact. Describe expected impact of the research project, if successful, to problem area.

D. Technical Approach:

1. {15 Pages} Detailed Description of Technical Approach. Provide detailed description of technical approach that will be used in this project to achieve research goals. Specifically identify and discuss innovative aspects of the technical approach.

2. {3 Pages} Comparison with Current Technology. Describe state-of-the-art approaches and the limitations within the context of the problem area addressed by this research.

E. {3 Pages} Statement of Work (SOW) written in plain English, outlining the scope of the effort and citing specific tasks to be performed and specific contractor requirements.

F. Schedule and Milestones:

1. {1 Page} Schedule Graphic. Provide a graphic representation of project schedule including detail down to the individual effort level. This should include but not be limited to, a multi-phase development plan, which demonstrates a clear understanding of the proposed research; and a plan for periodic and increasingly robust experiments over the project life that will show applicability to the overall program concept. Show all project milestones. Use absolute designations for all dates.

2. {3 Pages} Detailed Individual Effort Descriptions. Provide detailed task descriptions for each individual effort in schedule graphic.

G. {2 Pages} Deliverables Description. List and provide detailed description for each proposed deliverable. Include in this section all proprietary claims to results, prototypes, or systems supporting and/or necessary for the use of the research, results, and/or prototype. If there are no proprietary claims, this should be stated. The offeror must submit a separate list of all technical data or computer software that will be furnished to the Government with other than unlimited rights (see DFARS 227.) Specify receiving organization and expected delivery date for each deliverable.

H. {2 Pages} Technology Transition and Technology Transfer Targets and Plans. Discuss plans for technology transition and transfer. Identify specific military and commercial organizations for technology transition or transfer. Specify anticipated dates for transition or transfer.

I. {2 Pages} Personnel and Qualifications. List of key personnel, concise summary of their qualifications, and discussion of proposer's previous accomplishments and work in this or closely related research areas. Indicate the level of effort to be expended by each person during each contract year and other (current and proposed) major sources of support for them and/or commitments of their efforts. DARPA expects all key personnel associated with a proposal to make substantial time commitment to the proposed activity.

J. {1 Page} Facilities. Description of the facilities that would be used for the proposed effort. If any portion of the research is predicated upon the use of Government Owned Resources of any type, the offeror shall specifically identify the property or other resource required, the date the property or resource is required, the duration of the requirement, the source from which the resource is required, if known, and the impact on the research if the resource cannot be provided. If no Government Furnished Property is required for conduct of the proposed research, the proposal shall so state.

K. {1 Page} Experimentation and Integration Plans. Offerors shall describe how their results could be integrated with solutions that other contractors are currently developing or are likely to

develop. In addition, offerors should identify experiments to test the hypotheses of their approaches and be willing to work with other contractors in order to develop joint experiments in a common testbed environment. Offerors should expect to participate in teams and workshops to provide specific technical background information to DARPA, attend semi-annual Principal Investigator (PI) meetings, and participate in numerous other coordination meetings via teleconference or Video Teleconference (VTC). Funding to support these various group experimentation efforts should be included in technology project bids.

Volume II – Cost Proposal

In general, the cost proposal should provide summary and detailed cost breakdowns, by fiscal year quarter, for a phased program as described earlier. Offerors should assume an 1 October 2003 start date.

Volume II of the proposal shall consist of a) a Budget Cover Page, b) a Budget Summary, part 1 and 2, and c) Budget Details. There will be no page limitation assigned to Volume II. However, please restrict Volume II to strictly financial, legal, and contractual data.

Cover Page
This must include the words "Cost Proposal" and shall otherwise be identical to the Volume I cover page as described in Section H.2.1.

Budget Summary

1) Part 1 (one page): Summary of all costs by fiscal year:
    a. Labor hours by labor category;
    b. Labor costs by labor category;
    c. Equipment purchases and materials (vendor quotes or method of establishing cost)
    d. Travel
    e. Other indirect costs
    f. Fee
    g. Total
2) Part 2 (one page): Cost breakdown by task, and program Phase, using the same task numbers as in Technical Proposal statement of work.
3) Include any other relevant details and language that support or qualify the information in the budget summary.
4) Contractors requiring the purchase of information technology (IT) resources as Government Furnished Property (GFP) MUST attach to the submitted proposals the following information:

a) A letter on Corporate letterhead signed by a senior corporate official and addressed to **Mr. Gary Sauer,** DARPA/IXO, stating that you either can not or will not provide the information technology (IT) resources necessary to conduct the said research.

b) An explanation of the method of competitive acquisition or a sole source justification, as appropriate, for each IT resource item.

c) If the resource is leased, a lease purchase analysis clearly showing the reason for the lease decision.

d) The cost for each IT resource item.

IMPORTANT NOTE: IF THE OFFEROR DOES NOT COMPLY WITH THE ABOVE STATED REQUIREMENTS, THE PROPOSAL WILL BE REJECTED.

Awards made under this BAA may be subject to the provisions of the Federal Acquisition Regulation (FAR) Subpart 9.5, Organizational Conflict of Interest. All offerors and proposed subcontractors must affirmatively state whether they are supporting any DARPA technical office(s) through an active contract or subcontract. All affirmations must state which office(s) the offeror supports, and identify the prime contract number. Affirmations should be furnished at the time of proposal submission. All facts relevant to the existence or potential existence of organizational conflicts of interest, as that term is defined in FAR 9.501, must be disclosed in Section II, I. of the proposal, organized by task and year. This disclosure shall include a description of the action the Contractor has taken, or proposes to take, to avoid, neutralize, or mitigate such conflict.

Section III. Additional Information

A bibliography of relevant technical papers and research notes (published and unpublished) that document the technical ideas, upon which the proposal is based, may be included in the proposal submission. If a bibliography is required, it must be attached to the technical proposal.

The administrative addresses for this BAA are:

Fax: 571-218-4550 Addressed to: DARPA/IXO, BAA 03-33
Electronic Mail: baa03-33@darpa.mil
Electronic File Retrieval: http://www.darpa.mil/IXO/solicitations/multicell/index.htm